MITSUBISHI

TIME LAPSE VIDEO CASSETTE RECORDER

INSTALLATION AND OPERATION MANUAL

MODEL

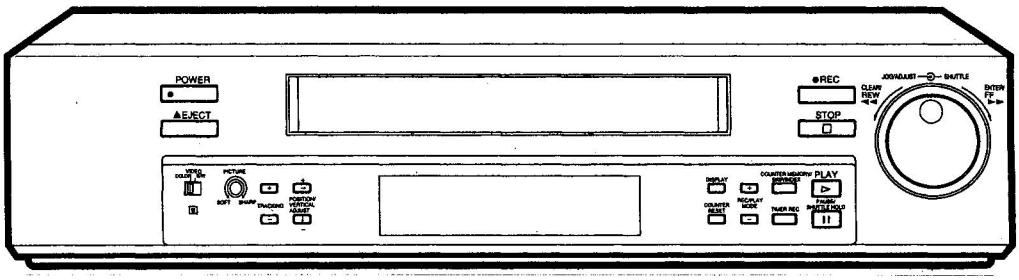
HS-7424E

ENGLISH

DEUTSCH

FRANÇAIS

ITALIANO



ONLY VIDEO CASSETTE TAPES WITH THE VHS MARK MAY BE USED WITH THIS MODEL.

THIS INSTRUCTION MANUAL IS IMPORTANT TO YOU.
PLEASE READ IT BEFORE USING YOUR VIDEO CASSETTE RECORDER.

CAUTION AND CARE

CONDENSATION IS THE ENEMY OF VIDEO RECORDERS

■ WHAT IS CONDENSATION?

1. When a very cold drink is poured into a glass, the water droplets which form on the outer surface of the glass are an example of condensation.
2. If the VCR is exposed to a rapid increase in temperature (such as warming a cold room or after transporting it from a cold location to a warm one) condensation may form on the tape transport mechanism inside the VCR. By heating the inside of the VCR, it can dry up the moisture and prevent damage to the VCR or video tape from condensation. To do this, plug the VCR in and switch the VCR POWER to ON. Leave the VCR on for at least 2 hours before using it for record or playback.

■ CONDENSATION IS LIKELY TO OCCUR WHEN:

1. The VCR is moved inside from outdoors, or from a cold room to a warm one.
2. A cold room is heated quickly.
3. Humidity is high.

NOTE:

- Avoid using the VCR where cold air (e.g., from an air conditioner) will blow directly on it.
- Never place anything containing water on top of the VCR, e.g., vases, cups, etc.

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HEAVY OBJECT SHOULD NEVER BE PLACED ON THE VCR (E.G., TV)

NEVER TOUCH OR INSERT ANY OBJECT INSIDE THE VCR
Touching the inside of the cabinet or inserting foreign objects of any kind not only creates a safety hazard but can also cause extensive damage.

PROTECT THE MAINS LEAD
Damage to the mains lead may cause fire or shock hazard. When unplugged, hold by the plug only and pull out carefully.

UNPLUG THE MAINS LEAD DURING A LONG ABSENCE
Turn off the power and unplug the mains lead during a long absence.

MAINTAIN GOOD VENTILATION
Do not obstruct the many ventilation holes on the VCR. For maximum ventilation, place the unit on a hard level surface only, and ensure it is not covered during use. Heavy objects should never be placed on the VCR.

WHEN NOT IN USE
When you finish operating the VCR always unload the cassette and turn OFF the VCR POWER.

CABINET CARE
Never use petroleum-based cleaners. Clean with a soft cloth moistened with soap and water and wipe dry. PVC cables or leads should not be left in contact with the cabinet surface for long periods.

INSTALLATION LOCATION
For excellent performance and lasting reliability install in location that is:

1. Well ventilated, out of direct sunlight and away from direct heat.
2. A solid vibration-free surface.
3. Free from high humidity, excessive dust and away from magnetic fields.

NOTE:

- Never move the VCR without first removing the tape.

CARE OF THE VIDEO CASSETTE TAPES

- Avoid violent vibration or shock.
- Do not place near a strong magnetic field (e.g., a motor, transformer or magnet).
- Never place or store in direct sunlight.
- Avoid dusty places.
- Place the cassette in its case and store vertically.
- Never store tape in high humidity.

This Time lapse Video Cassette Recorder complies with the requirements of the EC Directive 89/336/EEC, "EMC Directive" and 73/23/EEC, "Low Voltage Directive", as amended by Directive 93/68/EEC.
The requirements for the susceptibility according to EN 50082-1 and the requirements for interference according to EN 55022 are observed for the operation on residential areas, business, light industrial premises and in small scale enterprises, inside as well as outside of the building.
All places of operation are characterised by their connection to the public low voltage power supply system. This unit is manufactured in accordance with EN60065.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

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FEATURES

Up to 27 hours of recording:
an ideal video system for automated security and surveillance systems.

This time lapse VCR is designed especially for industrial, educational and security recording. In addition to ordinary 3-hour recording modes, it has time lapse modes that allows recording of 12 or 24 hours. Frame-by-frame playback and high-speed playback of longer recordings are also available. This adds up to a powerful surveillance system for banks, buildings, traffic and parking lots, as well as a convenient scientific tool for observation of plant growth, animal behavior and other time-intensive processes.

Audio recording
When recording in 3H, L(linear)12H, or L24H recording mode, you can get an audio playback in respective modes.

Resolution and image quality
This VCR has a great circuit, which makes it possible to attain more than 330 lines in B/W mode, and more than 240 lines in Color mode.

Automatic head cleaning
For continuous smooth operation, the VCR automatically removes foreign matter from the heads when a cassette is inserted.

Easy setting using the monitor
The on-screen menus simplify setting-up procedures. These menus can still be selected even without a video input signal.

Easy cueing with alarm recording
Index signals are added automatically at the beginning of "alarm recording" for easy cueing. You can even use the monitor to confirm the starting time of any recording.

External time clock adjustment
The on-screen time clock can be reset to the nearest hour, by applying a signal to the RST(RESET) IN terminal.

Recording check function
Correct recording can be confirmed by one touch.

Full lock mode
Locking each setting prevents the VCR from operating abnormally or being operated by a third party.

Special playback features
These include still images, speed search, reverse playback, frame-by-frame viewing in both directions, slow motion and high speed viewing.

JOG dial/ Shuttle ring
Use to search your desired image. You can adjust the playback speed with the shuttle ring and search for an image frame by frame with the JOG dial.

Recording options for varied needs
This versatile system offers a variety of recording options, including daily and weekly timed recording, repeat and alarm recording.

Protection against power failures
Recording data, including date, time and timer setup, are stored in backup memory, so the system can resume recording after a power failure. The time of the failure is displayed on the monitor.

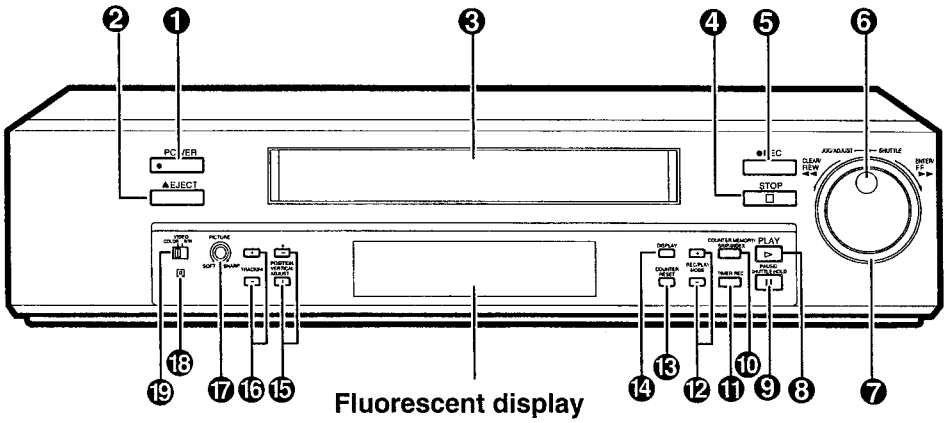
Digital <ELAPSED TIME> display
The Elapsed time of recording and playback is stored in a nonvolatile memory IC. The digital display is used as a guideline for exchange of the head.

Tape use counter
Displays how many times you have recorded in the repeat recording mode. Helpful for deciding the time of tape replacement.

Daylight saving time setting
The daylight saving time setting is available. The clock is put forward one hour by setting the menu.

FEATURES AND FUNCTIONS

FRONT VIEW



❶ POWER button (Press for on; press again for off)
The POWER indicator illuminates when the VCR is switched on.

❷ EJECT button
Press to remove the cassette.

❸ Cassette loading slot
Cassette tape is inserted in this slot for loading.

❹ STOP button
Press to discontinue all tape related functions.

❺ REC (RECORD) button
Press to begin recording.

❻ JOG dial
Use to forward the tape frame-by-frame and to set the menus.

❼ Shuttle ring
Use to adjust the playback speed or to set the menus. Turn this ring to the right to forward a tape or to forward search. Turn this ring to the left to rewind a tape or to reverse search. Also, use to reset the alarm list, power loss list and timer recording and to initialize the setting of menus.

❽ PLAY button
Press to playback a previously recorded tape.

❾ PAUSE/SHUTTLE HOLDbutton
When pressed during recording, stops movement of tape temporarily. Press again to continue the recording. When pressed during playback, stops the movement of tape and obtains the still field. Press again to restore normal playback.Pressing this button while turning and holding the shuttle ring, continues the playback speed you selected even though the shuttle ring is released.

❿ COUNTER MEMORY/SKIP/INDEX button
Used to skip-view recorded program by alarm recording. Used to locate the start of a recorded program by alarm recording.When pressed, the tape will fast rewind until the counter display indicates "00000" and automatically stops at this point.

⓫ TIMER REC button
This button is pressed when a timer recording is to be made.

⓬ REC/PLAY MODE buttons
Set to 3H, L12H or L24H mode to select recording speed and to 3H, L12H, 12H, L24H or 24H mode to select playback speed.

⓭ COUNTER RESET button
Press to reset the counter to "00000".

⓮ DISPLAY button
Press to display the MAIN MENU.
Press again to show the present time display.

⓯ POSITION/VERTICAL ADJUST buttons
- When pressed, the day and present time display will move right forward (+) or bottom forward (-). (except if a warning is displayed)
- Press these buttons when screen images of a still or slow-motion playback or fast playback picture in L12H, 12H, L24H or 24H mode are blurred vertically. Refer to pages 6 and 23 for the details.

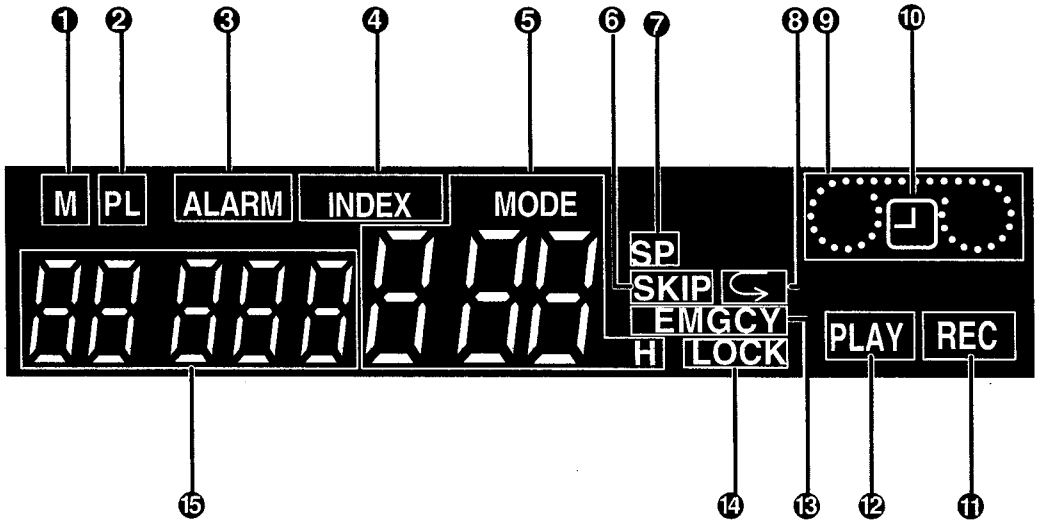
⓰ TRACKING (-) / TRACKING (+) button
Press these buttons if noise is present during playback, reverse playback or slow playback.

⓱ PICTURE control
The picture quality can be adjusted between soft and sharp.

⓲ LOCK button
When pressed with a ballpoint pen or a pencil, the unit will be locked into the current mode and the operation buttons will not function.Release by pressing it again.

⓳ VIDEO switch
Used to select color image or black & white image of recording and playback.

FLUORESCENT DISPLAY



❶ M (COUNTER MEMORY) indicator
Illuminates during rewind for counter memory mode.

❷ PL (POWER LOSS) indicator
Illuminates when there is a power failure during recording.

❸ ALARM indicator
Flashes during alarm recording and stays on when the alarm recording is finished.

❹ INDEX indicator
Flashes during recording of index signal and illuminates during index search.

❺ MODE (Record and playback mode) indicator
Displays the number corresponding to a selected recording or playback mode.

❻ SKIP indicator
Illuminates when set in the SKIP SEARCH mode.

❼ SP indicator
Indicates the tape speed.

❽ REPEAT indicator
Illuminates when the "TAPE END" of the "FIRST TIME SET UP"menu is set to "REPEAT" or "ALARM•PROT".

❾ Cassette status indicator
Illuminates when tape is inserted. The light advances, stops or flashes corresponding to the movement of the tape.

❿ TIMER REC indicator
Illuminates when the TIMER REC button is set to ON.

⓫ REC indicator
Illuminates during recording.

⓬ PLAY indicator
Illuminates during playback.

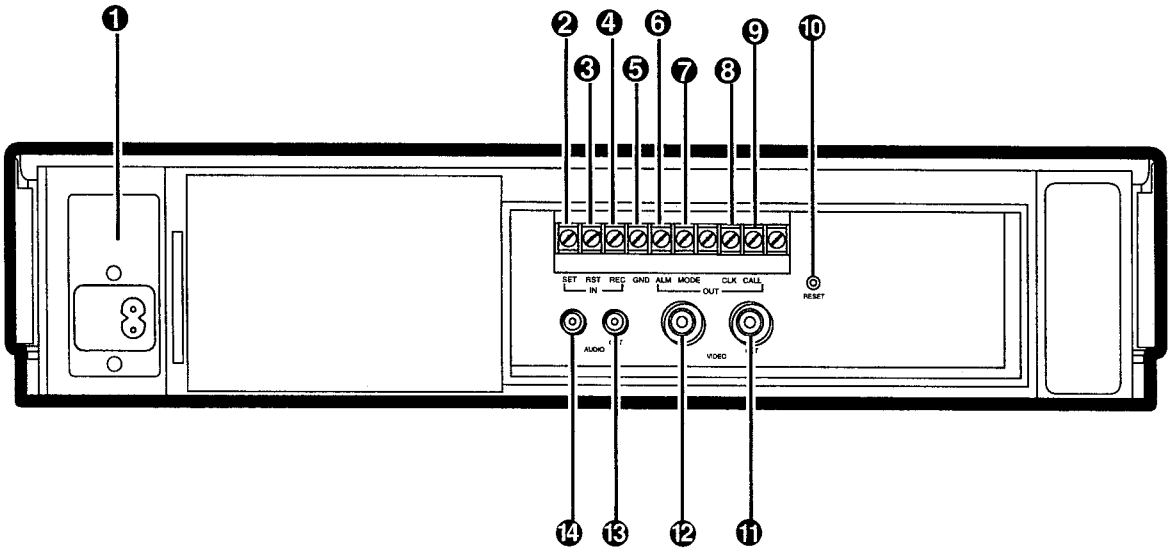
⓭ EMGCY (EMERGENCY REC) indicator
Illuminates when the "EMERGENCY REC" of "RECORDING SET UP" menu is set to "ON".

⓮ LOCK indicator
Illuminates when the lock feature is in use.

⓯ COUNTER display
Indicates the relative position on the tape.

ENGLISH

REAR VIEW



NOTE:

- Ensure the power cord is not plugged into the socket before connecting any rear terminals.

❶ AC power socket
This socket connects to the power cord. Insert the cord firmly.

❷ SET IN terminal
Input terminal for alarm recording. The alarm sensor is connected here.

❸ RST (RESET) IN terminal
Input terminal to stop alarm recording when the "ALARM REC DURATION " of RECORDING SET UP menu is set to "MAN 1".
The alarm reset switch is connected here. Also, this terminal can be used to set the on-screen clock when set to a mode except "MAN1".

❹ REC IN terminal
Input terminal to start/stop recording.
Also, use this terminal for series recording.

❺ GND (GROUND) terminal
When a lead connected to other terminals requires a ground, connect the ground lead here.

❻ ALM (ALARM) OUT terminal
Output terminal to relay alarm recording to an outside alarm.

❼ MODE OUT terminal
Output terminal to relay the VCR mode selected by the "MODE OUT" of REAR TERMINAL menu.

❽ CLK (CLOCK) OUT terminal
Output terminal for the camera switching.

❾ CALL OUT terminal
Output terminal to relay tape finishing and/ or internal abnormality during recording.

❿ RESET button
When pressed, the present time, alarm recording list, power loss list and the number of tape use will erase and power source is cut off. As long as the VCR is plugged in and a cassette tape is inserted, when pressed, the power will be switched off after forwarding the tape a few seconds.

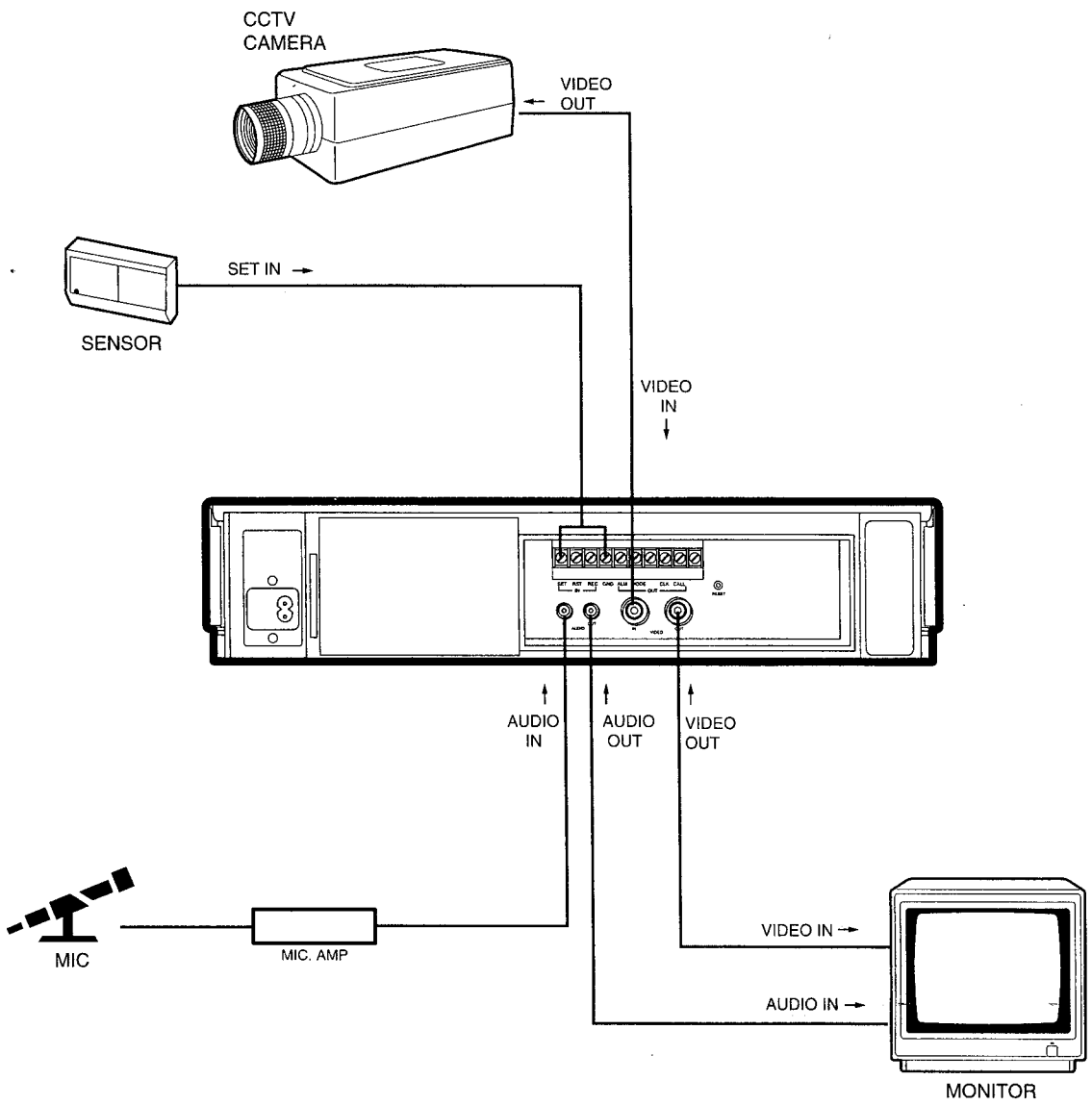
⓫ VIDEO OUT connector
Output connector for video signal (BNC connector).
If the power switch is turned OFF, the signal from the VIDEO IN connector is looped out to this connector.

⓬ VIDEO IN connector
Input connector for video signal (BNC connector).

⓭ AUDIO OUT connector
Audio output connector (RCA pin).

⓮ AUDIO IN connector
Audio input connector (RCA pin).

CONNECTING WITH OTHER EQUIPMENT



VERTICAL ADJUSTMENT (Correcting picture vibration at the top and bottom)

When watching a still, slow motion, fast playback or normal playback in L12H, 12H, L24H or 24H mode, the picture may vibrate. In this case, press the VERTICAL ADJUST(+) or (-) button to reduce or eliminate the picture vibration.
If this applies to all playback modes then :
- Adjust the "VERTICAL ADJUST" for 3H respectively by the following steps.

[1] Record image and still-playback the tape.
[2] Press the VERTICAL ADJUST (+) or (-) button to reduce or eliminate the picture vibration.

Monitor to be connected

- Connection with CCTV monitor (for surveillance) is recommended.
- Connecting with some monitors may cause picture vibration and/or picture distortion at the top or bottom of the image at still playback or normal playback.
  A television for domestic use may easily cause the picture vibration and distortion.

SETTING THE MENUS

This VCR can be set to an operating environment through menus.
Setting the menus by the following steps.

1 Press the DISPLAY button.
- The "MAIN MENU" is displayed.

2 Turn the JOG dial to select the desired item.
- When the JOG dial is turned to the right, the cursor moves downward.
- When the JOG dial is turned to the left, the cursor moves upward.

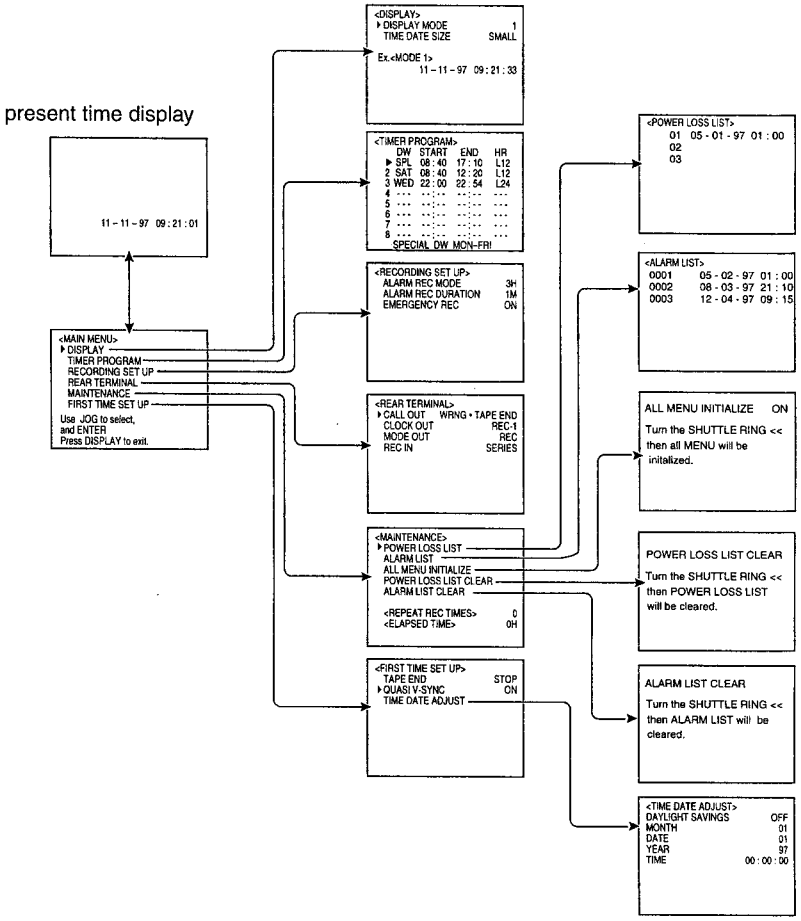
3 Turn the shuttle ring to the right.
The desired item is selected and the menu will appear.

4 Turn the JOG dial to select item.

5 Turn the shuttle ring to the right and the setting item will flash.

6 Turn the JOG dial to change the setting.

7 Turn the shuttle ring to the right to set.
8 Press the DISPLAY button.
- The present time display will appear.



MAIN MENU

```
<MAIN MENU >
   DISPLAY
   TIMER PROGRAM
   RECORDING SET UP
   REAR TERMINAL
   MAINTENANCE
▷ FIRST TIME SET UP
Use JOG to select,
and ENTER.
Press DISPLAY to exit.
```

1 DISPLAY
Sets the display format of the date and present time on the monitor.

2 TIMER PROGRAM
Sets the timer recording

3 RECORDING SET UP
Sets the alarm recording mode, alarm recording duration, emergency recording.

4 REAR TERMINAL
Sets the frequency division ratio of CLOCK OUT, output signal of CALL OUT terminal and MODE OUT terminal, etc..

5 MAINTENANCE
Displays the power loss list and alarm list, etc.. And initializes all menu settings, clears the power loss list or alarm list.

6 FIRST TIME SET UP
Sets the operation at the tape end and the present time, etc..

DISPLAY

1 SETTING DISPLAY MODE (DISPLAY MODE)

DISPLAY MODE 1: Displays date, and present time. (Refer to page 10.)
DISPLAY MODE 2: Displays date, day of the week, present time, recording mode. (Refer to page 10.)
DISPLAY MODE 3: Displays nothing; In the case of alarm recording, date, alarm recording number, etc. is displayed.
DISPLAY MODE 4: Displays nothing; Even in the case of alarm recording, nothing is displayed on the monitor.

<DISPLAY>
⊳DISPLAY MODE 1
TIME DATE SIZE SMALL

Ex.<MODE 1>
01 - 01 - 97 00:00:00

- When an alarm recording begins, the date, day of the week, present time, recording mode and alarm recording number are displayed if the "DISPLAY MODE" is set from 1 to 3. However, in the display mode 1, day of the week and recording mode are not displayed during an alarm recording.

2 SETTING THE SIZE OF THE LETTERS OF DAY AND PRESENT TIME DISPLAY (TIME DATE SIZE)

SMALL: The size of the letters becomes small.
LARGE: The size of the letters becomes large.

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TIMER PROGRAM

Refer to page 16 "TIMER PROGRAM" display for details.

RECORDING SET UP

1 SETTING THE ALARM REC MODE

Sets the alarm recording time mode. When the jog dial is turned, the display will be switched in the order of 3H → L12H → L24H → 3H → ....

<RECORDING SET UP>
⊳ALARM REC MODE 3H
ALARM RECDURATION 1M
EMERGENCY REC OFF

2 SETTING THE ALARM REC DURATION

Sets the duration of the alarm recording period. When the jog dial is turned, the display will be switched in the order of 1M(minute) → 2M → 5M → 10M → MAN1 → MAN2 → 15S(second) → 30S → 45S → 1M → ....
Refer to "ALARM RECORDING" on page 19.

3 SETTING EMERGENCY REC

Sets the emergency recording mode.
OFF: Starts alarm recording when the alarm signal is received during recording.
ON: Starts alarm recording when the alarm signal is received not only during recording but also when the power is OFF or when the tape is stopped.

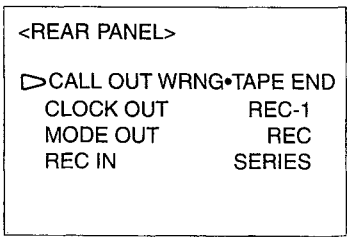
REAR TERMINAL

1 SETTING CALL SIGNAL OUTPUT AT THE TAPE END (CALL OUT)

Sets the mode of call signal output from the CALL terminal at the tape end during recording.
If any abnormalities occur with the VCR during recording, the CALL signal is output from the CALL terminal on the rear panel regardless of CALL OUT setting.

WRNG•TAPE END: The signal is output at the tape end or when a malfunction occurs.
WRNG: When a malfunction occurs in the VCR during recording, the call signal is output.
According to the combination with TAPE END setting (FIRST TIME SET UP), the CALL signal is output as shown below.

CALL OUT setting / TAPE END setting		WRNG•TAPE END	WRNG
STOP		Output at the tape end	When a malfunction occurs in the VCR during recording, the call signal is output.
REWIND		Output at the tape end for 2seconds	↑
REPEAT		↑	↑
ALARM • PROT	When there is not alarm recording duringrecording	↑	↑
	When there are alarm recording duringrecording	Output at the tape end	↑



2 SETTING THE FREQUENCY DIVISION RATIO (CLOCK OUT)

Sets the frequency division ratio of clock pulse output from the CLOCK OUT terminal.
First, set the recording mode available for clock pulse output.

REC: When recording in any mode.

T/L-REC: When recording in time lapse mode (L12, L24H).

Second, set the frequency division ratio. When the JOG dial is turned, the display will be switched in the order of 1 → 2 → 3 → 4 → 5 → 10 → 15 → 20 → 25 → 30 → 50 → 60 → F (field) → 1 → .... The numbers 1 to 60 indicate the number of frames in 3H recording mode or the number of fields in time lapse recording mode. (One frame consists of two fields.) One field is selected when it is set to "F" (field).

3 SETTING THE OPERATION MODE OF THE MODE OUTPUT TERMINAL (MODE OUT)

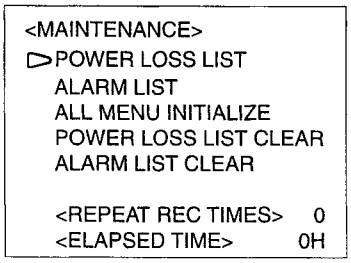
Set the state in which the signal output at the MODE OUT terminal is switched to the active condition. When the JOG dial is turned, the display will be switched on in the order of REC(recording) → PLAY(playback) → POWER (power "ON") → TAPE IN (tape is inserted) → CLOCK ADJ (output the signal for 1second when the clock indicates "00(min.):00(sec.)" → REC

4 SETTING THE OPERATION MODE OF THE REC IN TERMINAL (REC IN)

SERIES: Recording starts when the signal is input.

REC START/ END: Recording during the signal is input.
When the signal is not input, recording stops.

MAINTENANCE



1 DISPLAYING THE POWER LOSS LIST (POWER LOSS LIST)

The Power failure start time is stored in memory so it is possible to confirm the start times while recording. Up to 3 power failure start times will be displayed. If more than 3 failures have occurred, the first and last 2 power failure start times will be displayed.

2 DISPLAYING THE ALARM LIST (ALARM LIST)

The alarm record start time is stored in memory so it is possible to confirm the start times. Up to 3 alarm record start time will be displayed. If more than 3 alarms have occurred, the first and last 2 alarm lists will be displayed.

3 INITIALIZING ALL MENU SETTINGS (ALL MENU INITIALIZE)

Turn the shuttle ring to the right, "ALL MENU INITIALIZE" display will appear. When the shuttle ring is turned to the left, the each setting is initialized except TIMER RECORDING setting or when the shuttle ring is turned to the right, "MAINTENANCE"menu will appear.

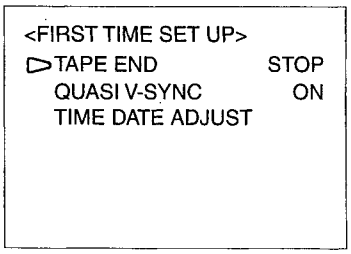
4 POWER LOSS LIST CLEAR

Turn the shuttle ring to the right, "POWER LOSS LIST CLEAR" display will appear. When the shuttle ring is turned to the left, the power failure time list is cleared. When the shuttle ring is turned to the right, the "MAINTENANCE" menu will appear.

5 ALARM LIST CLEAR

Turn the shuttle ring to the right, "ALARM LIST CLEAR" display will appear. When the shuttle ring is turned to the left, the alarm recording list is cleared. When the shuttle ring is turned to the right, the "MAINTENANCE" menu will appear.

FIRST TIME SET UP



1 SETTING OPERATION AT THE TAPE END (TAPE END)

Sets the operation of the VCR when the tape runs out during recording.

STOP: The tape stops, the indications "End" and "TAPE END" appear on the fluorescent display and on the screen respectively. When "CALL OUT" is set to "WRNG•TAPE END", CALL signal is output from the CALL terminal.

REWIND: Rewinds the tape to the beginning and stops. (Except during timer recording.) Outputs the CALL signal for 2 seconds at the tape end when "CALL OUT" is set to "WRNG•TAPE END", CALL signal is output from the CALLterminal.

REPEAT: Rewinds the tape to the beginning and resumes the recording.

ALARM•PROT(ALARM PROTECTION):
If any alarm recordings are present on the tape then the tape stops, the indications "End" and "TAPE END" appear on the fluorescent display and on the screen respectively. Outputs the CALL signal when "CALL OUT" setting is set to "WRNG•TAPE END". If there is no alarm recording, the tape is rewound and recording can resume.

2 SETTING QUASI-V-SYNC (QUASI V-SYNC)

Sets the quasi-V-sync. ON/OFF.

ON: Quasi-V-sync. signal is inserted to the video output signal in the special playback(still, slow motion, reverse, fast playback, speed search), normal playback in L12H, 12H, L24H or 24H mode.

OFF: Quasi-V-sync. signal is not inserted.

NOTE: Some multiplexers may require the Quasi-V-sync.OFF in order to work properly.

3 SETTING THE PRESENT TIME, DATE AND DAYLIGHT SAVING TIME SETTINGS (TIME DATE ADJUST)

Refer to the pages 10-11.

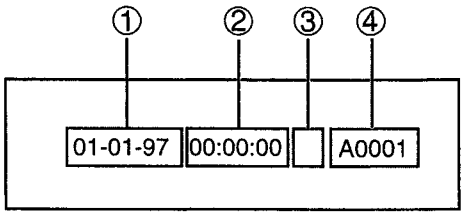
SETTING THE PRESENT TIME

ACCURATELY PRESET THE DAY AND PRESENT TIME BEFORE TIMER PROGRAMMING

<Display mode 1>

① Day-Month-Year
② Hour:Minute:Second
③ Daylight saving time symbol or power failure symbol
④ Alarm recording number

- A 24-hour display is used. 00:00 indicates midnight; 12:00 midday and 15:00 indicates 3 o'clock in the afternoon.
- An alarm recording number is shown during alarm recording.

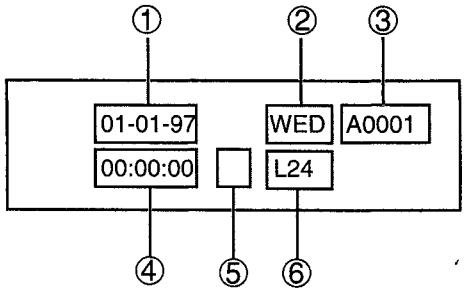


<Display mode 2>

In the display mode 2, it is also possible to set the day and present time.

① Day-Month-Year
② Day of the week
③ Alarm recording number
④ Hour:Minute:Second
⑤ Daylight saving time symbol or power failure symbol
⑥ Recording mode

- A 24-hour display is used. 00:00 indicates midnight; 12:00 midday and 15:00 3 o'clock in the afternoon.
- The day of the week is automatically set.
- An alarm recording number is shown during alarm recording.



ENGLISH

1 Press the DISPLAY button to display MAIN MENU on the monitor.

<MAIN MENU >
▷ DISPLAY
TIMER PROGRAM
RECORDING SET UP
REAR TERMINAL
MAINTENANCE
FIRST TIME SET UP

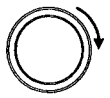
Use JOG to select,
and ENTER.
Press DISPLAY to exit.

2 Turn the jog dial to select "FIRST TIME SET UP".

<MAIN MENU >
▷ DISPLAY
TIMER PROGRAM
RECORDING SET UP
REAR TERMINAL
MAINTENANCE
FIRST TIME SET UP

Use JOG to select,
and ENTER.
Press DISPLAY to exit.

3 Turn the shuttle ring to the right .
• "FIRST TIME SET UP" setting menu will appear.

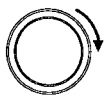


<FIRST TIME SET UP >
▷ TAPE END STOP
QUASI V-SYNC ON
TIME DATE ADJUST

4 Turn the jog dial to select "TIME DATE ADJUST".

<FIRST TIME SET UP >
TAPE END STOP
QUASI V-SYNC ON
▷ TIME DATE ADJUST

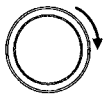
5 Turn the shuttle ring to the right .
• "TIME DATE ADJUST" setting menu will appear.



<TIME DATE ADJUST >
DAYLIGHT SAVINGS OFF
MONTH 01
DATE 01
YEAR 97
TIME 00:00:00

SETTING THE PRESENT TIME

6 Setting the daylight saving time
The clock is put forward one hour when "DAYLIGHT SAVINGS" is set to "ON".
Turn the shuttle ring to the right, the display of the daylight savings will flash.
Turn the jog dial to switch "OFF" or "ON".
- The daylight saving time symbol is displayed next to the present time display and the clock is put forward one hour.
- To cancel the daylight saving time, switch to "OFF".

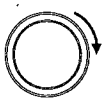


<TIME DATE ADJUST >
DAYLIGHT SAVINGS OFF
MONTH 01
DATE 01
YEAR 97
TIME 00:00:00

NOTE:
- Power failure mark "X" is displayed prior to saving time symbol "☼".
- Daylight saving time symbol "☼" is displayed after "X" symbol goes off.

<TIME DATE ADJUST >
DAYLIGHT SAVINGS ON
MONTH 01
DATE 01
YEAR 97
TIME 00:00:00

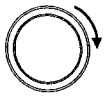
7 Setting the month
Turn the shuttle ring to the right, the month display will flash.
Turn the jog dial to the right to set the "MONTH".



<TIME DATE ADJUST >
DAYLIGHT SAVINGS ON
MONTH 01
DATE 01
YEAR 97
TIME 00:00:00

8 Setting the date
Turn the shuttle ring to the right, the date display will flash.
Turn the jog dial to the right to set the "DATE".

<TIME DATE ADJUST >
DAYLIGHT SAVINGS ON
MONTH 08
DATE 01
YEAR 97
TIME 00:00:00



<TIME DATE ADJUST >
DAYLIGHT SAVINGS ON
MONTH 08
DATE 01
YEAR 97
TIME 00:00:00

9 Setting the year
Turn the shuttle ring to the right, the year display will flash.
Turn the jog dial to the right to set the "YEAR".
- The year digits can be set to 1997-2027.

<TIME DATE ADJUST >
DAYLIGHT SAVINGS ON
MONTH 08
DATE 05
YEAR 97
TIME 00:00:00

10 Setting the present time
Turn the shuttle ring to the right, the hour digits of "TIME" display will flash.
Turn the jog dial to the right to set the hour digits of the present time.
- If necessary, similarly set the 10 minutes digits and minute digit.

<TIME DATE ADJUST >
DAYLIGHT SAVINGS ON
MONTH 08
DATE 05
YEAR 97
TIME 00:00:00

11 Turn the shuttle ring to the right.
(Setting is now complete.)
12 Press the DISPLAY button.
(The present time display will appear.)

<TIME DATE ADJUST >
DAYLIGHT SAVINGS ON
MONTH 08
DATE 05
YEAR 99
TIME 00:00:00

NOTE:
- The POWER button cannot operate when this display continues to flash.

■ SETTING THE PRESENT TIME TO THE EXACT SECOND

Set the clock as described above, but set the minutes one or two minutes ahead of the reference time being used. When the reference time reaches 00 seconds of the minute you have chosen, turn the shuttle ring to the right. The VCR time now corresponds to the reference time to the nearest second.

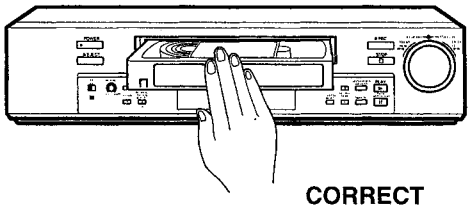
LOADING AND UNLOADING THE CASSETTE TAPE

Video cassette tapes can be loaded into your new VCR as long as the VCR is plugged into a power source. Even if the VCR power switch is turned off, loading a cassette will automatically cause it to turn on. Use only video cassette tapes marked HS.
Use only standard grade VHS cassette tapes for reliable video recording. Please do not use: Pro; Hi-Fi and High Grade tapes as damage to recording heads may occur.

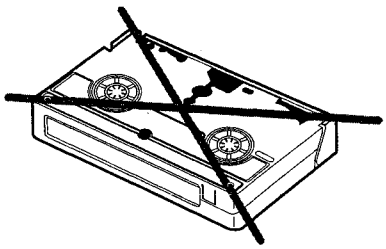
LOADING

1 To position the cassette properly before inserting it in the cassette slot, hold the cassette so that the long narrow edge with the contents label faces towards you. The other long narrow edge is hinged and should face towards the VCR. The clear plastic window that shows the video tape should face upward.

2 Gently insert the videotape into the cassette slot to a point where the VCR automatically retracts the cassette.
- When you insert the videotape, be sure to orient it squarely to the slot.



CORRECT



INCORRECT

NOTE:
Your new VCR has a protection circuit which will eject the tape if it is loaded improperly. If the VCR ejects the tape you are trying to load, remove it completely and check that the long narrow edge with the contents label is facing towards you and that the clear plastic window that shows the video tape is facing upwards. Then try again.

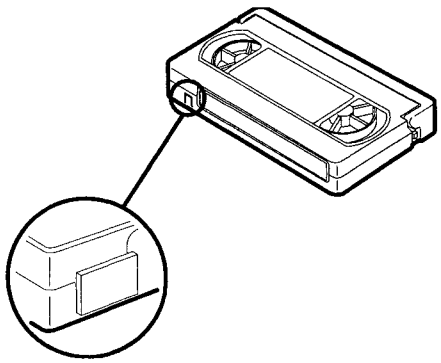
UNLOADING

1 Press the EJECT button on the front of the VCR.
2 Remove the cassette.

Your VCR will eject a video cassette even if the power to the VCR is turned off (as long as the VCR is plugged into an outlet).
It is impossible to eject the tape in the lock mode. When the EJECT button is pressed, the VCR will automatically turn on, eject the tape, and turn off. However, in the recording mode,
it is not possible to eject a tape without first pressing STOP, from the remote or on the front panel of the VCR and then pressing EJECT.

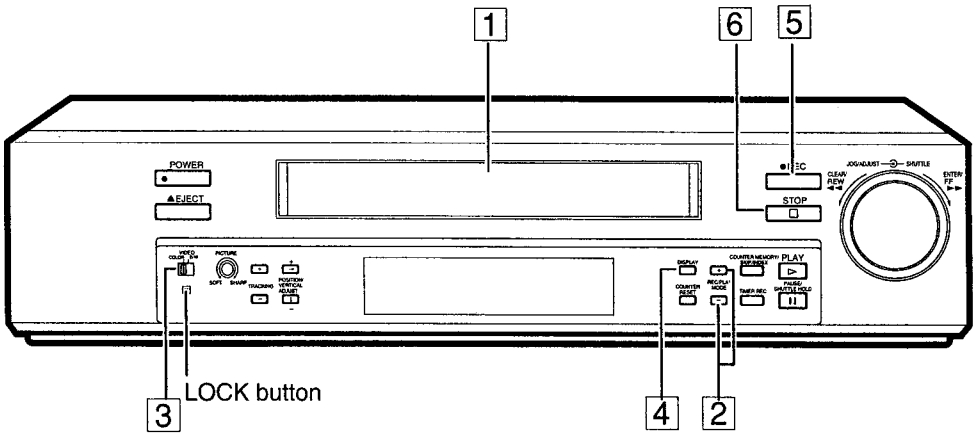
PREVENTING ACCIDENTAL ERASURE
Video cassettes come with an erasure prevention tab which, when removed, prevents the tape's contents from being erased, or recorded over.
If the cassette you insert in your VCR has the erasure prevention tab removed, your VCR will automatically eject it if you attempt to record on it.

NOTE:
- We recommend that any torn or broken cassette tape requiring repair be taken to professionals who specialize in such procedures. The adhesives on many common types of tape could damage the head of your VCR.



ENGLISH

MANUAL RECORDING



1 Load a cassette with the erasure prevention tab intact.
2 Press the REC/PLAY MODE (-) or (+) buttons to select the desired recording mode.
3 Select the VIDEO switch setting according to the type of image to be recorded, COLOR or B/W.
  • Do not connect color and black & white cameras together.
4 To record the day and present time, display the day and present time on the monitor.
5 Press the REC button to begin recording.
6 Press the STOP button to stop recording.

NOTE:

- Press the PAUSE/SHUTTLE HOLD button to momentarily stop recording. Press the button again to resume recording.
- To protect the tape, the pause mode is automatically released after about 5 minutes.
- The REC button will not function unless a tape is in stop or pause mode.
- If the cassette you insert in your VCR has the erasure prevention tab removed, your VCR will automatically eject it if you attempt to record on it.
- A tape recorded by this VCR may be playback correctly by another VCR.
- If there is a power failure during recording, the VCR will be set to the recording mode when the power comes back on.

■ RECORDING MODE

When the REC/PLAY MODE button is pressed, the recording mode is switched in the order of 3H → L12H → L24H → 3H → ....

RECORDING CHECK FUNCTION

Correct recording can be confirmed by one touch.
Press the PLAY button for more than 1.5 seconds during recording. Then, the tape rewinds a little and plays back. When the tape reaches the original position, the VCR returns to the record mode.

AUDIO RECORDING

Apply the specified line input signal to the AUDIO IN connector.

NOTE:

- There is normal sound playback only when a tape recorded in 3H, L12H and L24H modes is played back in their respective mode.
- The longer the recording time mode is set, the sound quality gets worse. In L24H mode, the sound quality is of the degree that the speaking voice can be heard.

LOCK MODE

When the lock button is pressed with a ballpoint pen or a pencil, the control buttons will not operate and the VCR is kept in the current mode. To release the lock mode, press the lock button again.

REPEAT RECORDING

When the "TAPE END" of "FIRST TIME SET UP" menu is set to "REPEAT" or "ALARM•PROT" and the repeat recording mode is set (the REPEAT indicator is illuminated), the tape will automatically be rewound to the start when the tape end is reached and recording will start again.

■ WHEN TAPE END IS REACHED

The following functions are automatically engaged when the tape ends during recording.

	STOP	REWIND	REPEAT	ALARM•PROT
When there are alarm recordings on tape.	The tape stops.	The tape is rewound automatically to the beginning and then stops.	The tape is rewound automatically to the beginning and recording is resumed.	The tape stops.
When there are no alarm recordings on tape.				The tape is rewound automatically to its beginning and then the recording is resumed.

NOTE: The record of alarm recording will be cleard if the tape is ejected.

THE NUMBER OF TAPE USE (REPEAT REC TIMES)

Display the number of tape use when the TAPE END setting is set to "REWIND", "REPEAT" or "ALARM• PROT".

1. Press the DISPLAY button.
   MAIN MENU display will appear.
2. Turn the jog dial to select "MAINTENANCE" and turn the shuttle ring to the right to enter.
   "MAINTENANCE" display will appear. "REPEAT REC TIMES" indicates the number of tape use.
3. Press the DISPLAY button.
   The present time display will appear.
   - The number of tape use counts when the tape ends.
   - The number of tape use is memorized even if the POWER is turned OFF.
   - The number of tape use is reset when the tape is replaced by any tapes.

```
<MAINTENANCE >
▷ POWER LOSS LIST
  ALARM LIST
  ALL MENU INITIALIZE
  POWER LOSS LIST CLEAR
  ALARM LIST CLEAR

  <REPEAT REC TIMES>     0
  <ELAPSED TIME>        0H
```

RECOMMENDED NUMBER OF TAPE USE

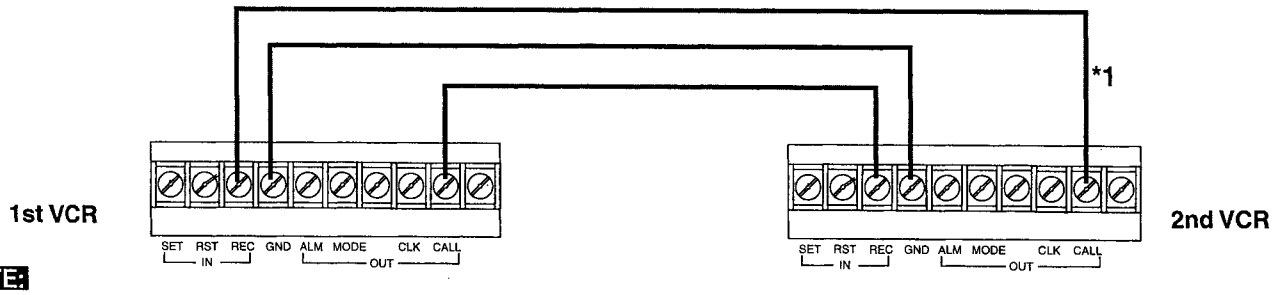
It is recommended that the cassette tape is replaced with a new one according to the following number of tape use.

Recording time mode	Number of tape use
	E-180 cassette
3H	100
L12H	60
L24H	35

SERIES RECORDING

Series recording is possible if two or more of these units are connected: when the first VCR reaches the tape end, the second VCR automatically begins recording.

1. Set the "REC IN" of "REAR TERMINAL" menu to "SERIES".
2. Set the "CALL OUT" of "REAR TERMINAL" menu to "WRNG•TAPE END".
3. Set the "TAPE END" of "FIRST TIME SET UP"menu to "REWIND".



NOTE:

- When the first VCR reaches the tape end with the above setting, the second VCR automatically begins recording and the first VCR rewinds the tape. And when the second VCR reaches the tape end, the first VCR automatically begins recording and the second VCR rewinds the tape. The first and the second VCR begins recording with each other. If the first VCR has not resumed recording, when the second VCR reaches the tape end, do not connect *1.
- When an abnormality occurs (e.g., a malfunction occurs in the motor during recording) in the first VCR, the second VCR automatically begins recording.
- Series recording will not function during timer recording.
- When carrying out series recording, set the "CALL OUT" of "REAR TERMIANL" setting display to a mode except "WRNG".

ENGLISH

ADDITIONAL FEATURES

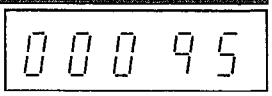
COUNTER MEMORY

When the COUNTER MEMORY/ SKIP/ INDEX button is pressed, the "M" indicator on the fluorescent display is lit and turn the shuttle ring to the right and the tape will rewind to the "00000" position of the counter and stop. (The rewind position is slightly inaccurate.)

NOTE: The counter display is stored in the memory when the power is turned off, so the same numbers will be displayed when the power is turned back on.

TAPE COUNTER

An illuminated digital display which provides a five digit numerical indication of the relative position on the tape.

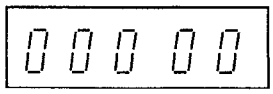


- "EEE EE" illuminates to indicate that the VCR power is in stand-by mode.

ENGLISH

COUNTER RESET

Press the COUNTER RESET button to reset the counter to "00000".



MEMORY BACK-UP IN CASE OF POWER FAILURE

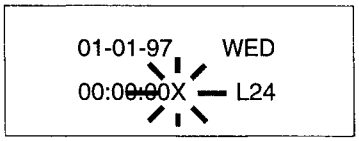
This VCR includes a built-in memory back-up, so the presettings of day and present time, alarm recording list, power loss list and the number of tape use will remain in the memory even if there is a power failure or the POWER CORD is disconnected. The presetting (the present time, alarm recording list, power failure list and the number of tape use) remains in the memory for a maximum of 31days when the POWER CORD is connected for 40 or more hours per week.The present time may change if there is a power failure or if no power is supplied.

- Check the present time if there has been a power failure or the POWER CORD is disconnected for a long period time.

RECORDING AFTER A POWER FAILURE

If there is a power failure during recording, the VCR will be set to the recording mode when the power comes back on. If there is a power failure during timer recording or alarm recording, the VCR will be set to the recording mode when the power comes back on. A "X" will be displayed for about 1 minute next to the present time display on the monitor when the power comes back on.

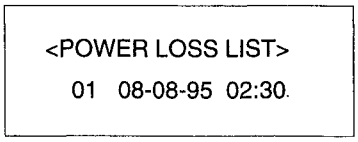
If there is a power failure during playback, the VCR is in stop mode when the power comes back on.



POWER FAILURE TIME DISPLAY

The Power failure start time on recording is stored in the memory so it is possible to confirm the start times.

1. Press the DISPLAY button to display the MAIN MENU.
2. Turn the jog dial to select "MAINTENANCE" and turn the shuttle ring to the right. "MAINTENANCE" display will appear.
3. Turn the jog dial to select "POWER LOSS LIST" and turn the shuttle ring to the right. "POWER LOSS LIST" will appear.

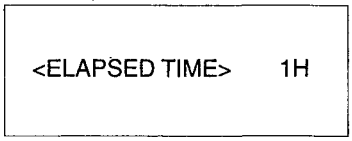


- Up to 3 power failure start times will be displayed. If more than 3 failures have occurred, the first and last 2 power failure start times will be displayed.
- To reset the "POWER LOSS LIST", select the "POWER LOSS LIST CLEAR" in the "MAINTENANCE" setting display and turn the shuttle ring. The initialize menu will appear and turn the shuttle ring to the left.

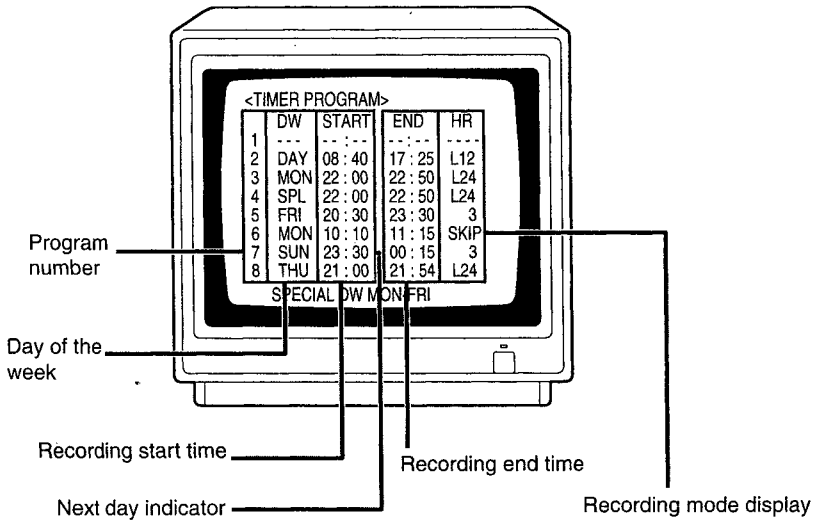
ELAPSED TIME DISPLAY

The Elapsed time of recording and playback is stored in the memory. The digital display is used as a guideline for the replacement of the heads.

1. Press the DISPLAY button to display the MAIN MENU.
2. Turn the jog dial to select "MAINTENANCE" and turn the shuttle ring to the right. "ELAPSED TIME " is indicated.
   - The elapsed time is counted up to 89,999 hours.
3. Press the DISPLAY button. The present time display will appear.



TIMER RECORDING


<TIMER PROGRAM>
DW START END HR
1 --- -- :-- --:-- ----
2 DAY 08 : 40 17 : 25 L12
3 MON 22 : 00 22 : 50 L24
4 SPL 22 : 00 22 : 50 L24
5 FRI 20 : 30 23 : 30 3
6 MON 10 : 10 11 : 15 SKIP
7 SUN 23 : 30 00 : 15 3
8 THU 21 : 00 21 : 54 L24
SPECIAL DW MON-FRI
Program number
Day of the week
Recording start time
Next day indicator
Recording end time
Recording mode display

- "DAY" (in "Day of the week") is used for the same time recording everyday.
- "SPL" (special) (in "Day of the week") indicates that the recording period set in "TIMER PROGRAM" display becomes available. See page 17.
- "SKIP" (in "HR") indicates that timer recording is not performed during the set period.
- A 24-hour display is used. 00:00 indicates midnight; 12:00 midday and 15:00 3 o'clock in the afternoon.
- If the recording times of two programs overlap, the higher program number is given priority.
- In 3H, L12H or L24H mode, audio is also recorded.

<MAIN MENU >
DISPLAY
▷ TIMER PROGRAM
RECORDING SET UP
REAR TERMINAL
MAINTENANCE
FIRST TIME SET UP

Use JOG to select,
and ENTER.
Press DISPLAY to exit.

<TIMER PROGRAM >

	DW	START	END	HR
▶	SPL	08 : 40	17 : 10	L12
2	---	--:--	--:--	---

	DW	START	END	HR
1	SPL	08 : 40	17 : 10	L12
▶	---	--:--	--:--	---

	DW	START	END	HR
1	SPL	08 : 40	17 : 10	L12
▶	SAT	--:--	--:--	---

	DW	START	END	HR
1	SPL	08 : 40	17 : 10	L12
▶	SAT	--:--	--:--	---

	DW	START	END	HR
1	SPL	08 : 40	17 : 10	L12
▶	SAT	08 : 00	--:--	---

	DW	START	END	HR
1	SPL	08 : 40	17 : 10	L12
▶	SAT	08 : 40	--:--	---

	DW	START	END	HR
1	SPL	08 : 40	17 : 10	L12
▶	SAT	08 : 40	12 : 00	---

	DW	START	END	HR
1	SPL	08 : 40	17 : 10	L12
▶	SAT	08 : 40	12 : 00	---

	DW	START	END	HR
1	SPL	08 : 40	17 : 10	L12
▶	SAT	08 : 40	12 : 00	L24

1 Press the DISPLAY button to display the MAIN MENU on the monitor.

2 Turn the jog dial to select "TIMER PROGRAM" and turn the shuttle ring to the right.
- "TIMER PROGRAM" display will appear.

3 Turn the jog dial to select the program number and turn the shuttle ring to the right.(The day of the week display flashes.)

4 Setting the day of the week (DW).
Turn the jog dial to set the day of the week and turn the shuttle ring to the right.

5 Setting the recording start time (START).
Turn the shuttle ring to select the recording start time display.
Turn the jog dial to set the recording start time.

6 Setting the recording end time (END).
Turn the shuttle ring to select the recording end time display.
Turn the jog dial to set the recording end time.

7 Setting the recording mode (HR).
Turn the shuttle ring to select the recording mode display.
Turn the jog dial to set the recording mode.

8 Turn the shuttle ring to the right.
(The display stops flashing.)
If the program has not been set completely, the flashing will not stop.

- If the END time is the same or earlier than the START time, the next day indicator (•) is automatically displayed.
  This indicates that the recording will run continuously from the START time on the first day to the END time on the next day.
- When setting another program, turn the shuttle ring to set and repeat steps 3 - 8. A maximum of eight programs can be made.
- To erase the program setting, select the program number to be erased and turn the shuttle ring to the left.

9 Press the DISPLAY button to show the day and present time on the monitor.
10 Press the TIMER REC button.
(The TIMER REC indicator is illuminated.)

TIMER RECORDING

SETTING RECORDING PERIOD BY SPECIFYING THE DAYS OF THE WEEK (SPECIAL DW)

Set the recording period by specifying the start and end day of the week for timer recording.

1. Display the "TIMER PROGRAM" setting display.
2. Turn the jog dial to select "SPECIAL DW" and turn the shuttle ring to the right.
3. Turn the jog dial to set the start day and turn the shuttle ring to the right.
4. Turn the jog dial to set the end day and turn the shuttle ring.

• It is impossible to set two days of the week to the same day.

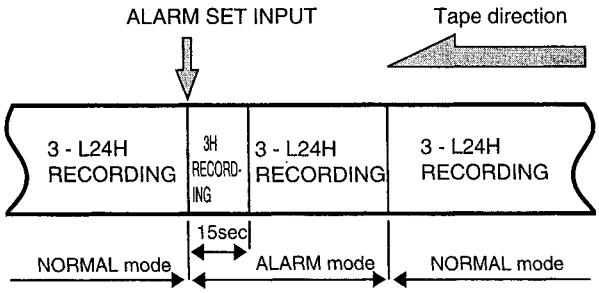
IN ORDER TO AVOID MISTAKES WHEN USING THE TIMER

If an error is encountered when the TIMER REC button is pressed, refer to the following table.

Symptom	Cause of fault	Action
TIMER REC indicator flashes.	• A tape is not inserted. • A tape with the erasure prevention tab removed is loaded. • Date, time or timer recording time is not set. • A menu is being set.	1. Press the TIMER REC button. 2. Correct the fault. 3. Press the TIMER REC button and confirm the TIMER REC indicator (⏎) is illuminated.

ALARM RECORDING

IT IS POSSIBLE TO SWITCH FROM ALL RECORDING MODES TO THE 3-L24H RECORDING MODE BY APPLYING AN ALARM SIGNAL TO THE SET TERMINAL ON THE REAR PANEL.

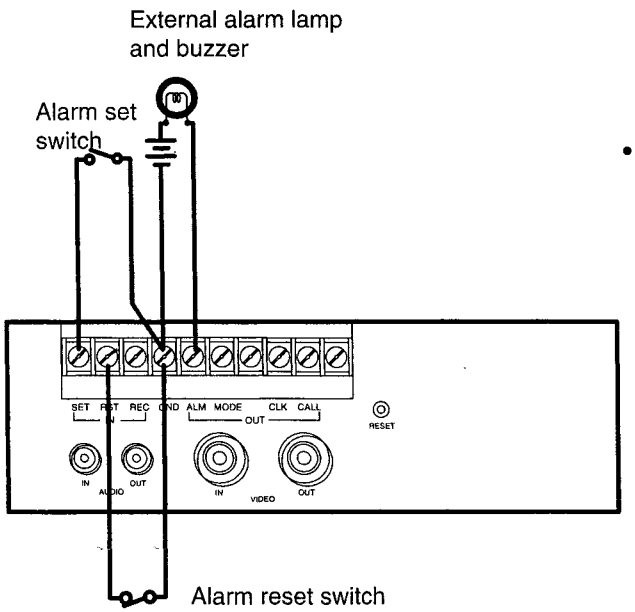


- It is possible to switch to the alarm recording mode (3- L24H) and record the status in detail by applying the set signal from the alarm sensor during recording.

- Set the alarm recording mode and alarm recording period with the RECORDING SET UP menu. (See page 8.)
- The index signal is automatically recorded when an alarm recording begins.(INDEX indicator flashes on the fluorescent display.)
- To record the index signal, the first 15seconds of the alarm recording are in the 3H mode.
- While the index signal is being recorded (15 seconds), another SET signal will not be received.

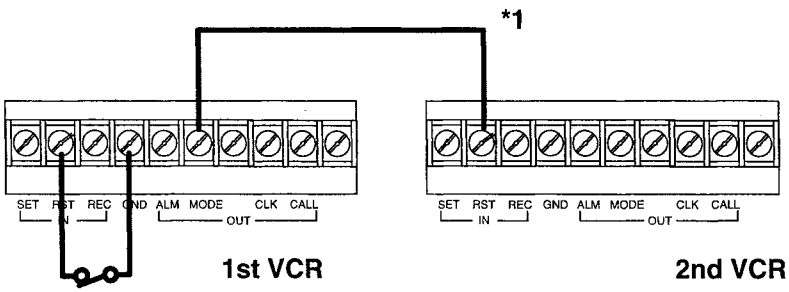
ENGLISH

ALARM RECORDING CONNECTION



- The alarm can be confirmed from a distance by connecting the "alarm out" switch to an existing alarm system panel or other external devices such as a buzzer.

EXTERNAL TIME CLOCK ADJUSTMENT



If the "ALARM REC DURATION" of "RECORDING SET UP" menu is set to other than "MAN 1", the on-screen clock can be reset to the nearest hour, by applying a signal to the RST IN terminal. For example, if the current time is 11:29:59 it will be reset to 11:00:00, and if the current time is 11:30:00 it will be reset to 12:00:00.

*1: When connecting MODE terminal of 1st VCR with RST terminal of 2nd VCR, the on-screen clock of 2nd VCR can be adjusted to that of 1st VCR.

ALARM RECORDING

SETTING THE ALARM RECORDING

You must set the alarm recording state with the RECORDING SET UP menu before executing alarm recording.

1 Press the DISPLAY button to display MAIN MENU on the monitor.

<MAIN MENU >
DISPLAY
TIMER PROGRAM
▷ RECORDING SET UP
REAR TERMINAL
MAINTENANCE
FIRST TIME SET UP

Use JOG to select,
and ENTER.
Press DISPLAY to exit.

2 Turn the jog dial to select "RECORDING SET UP" and turn the shuttle ring to the right.
- "RECORDING SET UP" menu will appear.

3 Turn the jog dial to select "ALARM REC MODE " and turn the shuttle ring to the right.

<RECORDING SET UP >
▷ ALARM REC MODE 3H
ALARM REC DURATION 1M
EMERGENCY REC ON

4 Turn the jog dial to set the alarm recording mode and turn the shuttle ring to the right.

5 Turn the jog dial to select "ALARM REC DURATION" and turn the shuttle ring to the right.

<RECORDING SET UP >
ALARM REC MODE 3H
▷ ALARM REC DURATION 1M
EMERGENCY REC ON

6 Turn the jog dial to set the alarm recording duration and turn the shuttle ring to the right.
Set the period during which alarm recording is to be executed when the alarm signal is entered. (15 seconds to 10 minutes and manual (MAN1 or 2).)
- If the "ALARM REC DURATION" is set to "MAN1", alarm recording continues until the alarm reset switch is switched on. Even though the alarm reset switch is switched on within15 seconds after alarm recording starts, the alarm recording continues for 15 seconds.
- If the "ALARM REC DURATION" is set to "MAN2", alarm recording continues until the alarm set switch is switched off. Alarm recording continues at least 15 seconds after alarm recording starts even though the alarm set switch is switched off.
- External time clock adjustment functions if a signal is applied to the RST (RESET) terminal on the rear panel when the ALARM REC DURATION" is set to other than "MAN1".

7 Turn the jog dial to select "EMERGENCY RECORDING" and turn the shuttle ring to the right.
- Turn the jog dial to set to "ON".

<RECORDING SET UP >
ALARM REC MODE 3H
ALARM REC DURATION 1M
▷ EMERGENCY REC ON

8 Press the DISPLAY button.
The present time display will appear.

■ During alarm recording, the alarm recording count will automatically be displayed except the DISPLAY mode "4".
- The Alarm recording count display counts up to 9999 alarm recordings and then it is reset to 0000 and continues counting.
- When initializing the alarm recording list, the alarm recording count display will be reset.
- The alarm indicator flashes during alarm recording and lights up when the alarm recording is finished.
- When the alarm recording is finished, the VCR resumes the previous mode.
- Alarm recording begins when the SET signal is input during setting of any menu.

NOTE:
- If the set signal is applied during alarm recording, a new alarm recording will start at the new time. While the index signal is being recorded (15 seconds), another SET signal will not be received.
- Alarm recording will be continued during the alarm time which has been set in ALARM REC DURATION, even if the timer recording end time is reached.
- Alarm recording stops when the tape end is reached.

EMERGENCY RECORDING

This function automatically starts alarm recording when the set signal is applied, even when the VCR is not recording. If the "EMERGENCY REC" of the MAINTENANCE menu is set to "ON", alarm recording starts automatically when a signal is received by the SET IN terminal in recording mode and in stop mode (including timer recording stand-by mode or the power is turned OFF).
- "EMGCY" lights up on the fluorescent display when the "EMERGENCY REC" of the MAINTENANCE menu is set to "ON".

ALARM RECORD TIME DISPLAY

The Alarm record start time on recording is stored in the memory so it is possible to confirm the start times. Select the ALARM LIST in the MAINTENANCE menu and the alarm recording list display will appear on the screen.

- The Alarm record start times will be stored in the memory up to 3 times. For more than that, the first and last two alarm record start times will be displayed.
- The alarm recording list is reset by the following procedure.
  1. Select the ALARM LIST CLEAR of the MAINTENANCE menu.
  2. Turn the shuttle ring to the right. The display will appear.
  3. Turn the shuttle ring to the left. The alarm list will be cleared.

<ALARM LIST>

0001	05-08-97	06:30
0002	09-08-97	23:30
0003	10-09-97	17:30

LOCATING THE START OF ALARM RECORDED PROGRAMS

This machine automatically inserts an index signal at the beginning of each ALARM RECORDING allowing the start of each alarm to be located.

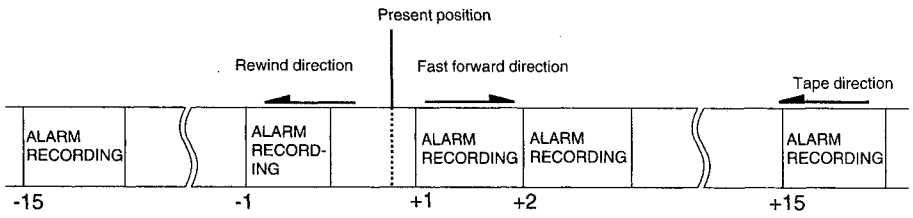
■ INDEX SEARCH

During fast forwarding or rewinding the machine will search for index signals. When an index signal is found, the VCR will stop and still playback will commence.

1. Press the SKIP/INDEX/COUNTER MEMORY button to illuminate "INDEX" on the fluorescent display. (On the fluorescent display "INDEX" will be illuminated and the number indication will be illuminated.)
2. Turn the JOG dial to display the number (1-15) corresponding to the alarm index you desire to locate.
3. Turn the shuttle ring to the right (forward direction) or left (rewind direction).

(The program indication number will decrease one by one as each index signal goes by.)

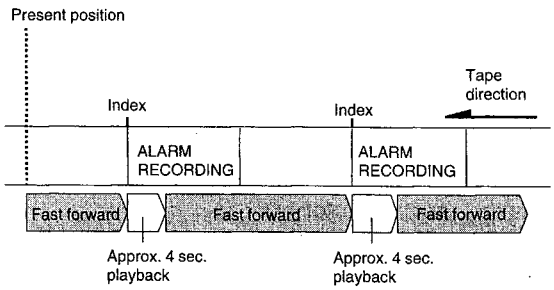
- The index signal may be difficult to locate in some recording conditions.



■ SKIP SEARCH

This allows you to view approximately 4 seconds of the beginning of each ALARM RECORDING to find a particular alarm recording.

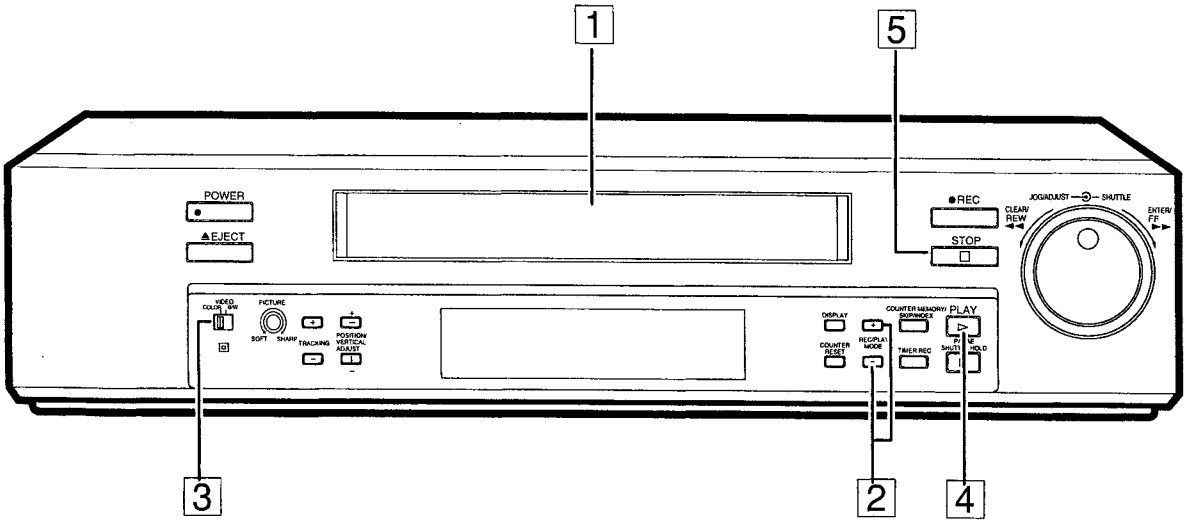
1. Press the SKIP/INDEX/COUNTER MEMORY button to illuminate "SKIP" on the fluorescent display.
2. Turn the shuttle ring to the right or left.



Until the index signal is located the machine will fast forward (or rewind). When an index signal is located the machine will playback (at 3H mode) for about 4 seconds. This process will be repeated until the end or the beginning of the tape is reached.

- When the desired position is located, press the PLAY button.
- To stop SKIP SEARCH, press the STOP button.
- The index signal may be difficult to locate in some recording conditions.

PLAYBACK



1 Load a pre-recorded tape.
AUTO PLAY:
If a cassette with the erasure prevention tab removed is loaded the unit automatically begins playback mode.
2 Press the REC/PLAY MODE (+) or (-) buttons to select the desired playback mode.
3 Select the VIDEO switch setting according to the type of video signal to be played back, COLOR or B/W.
4 Press the PLAY button to start playback.
5 Press the STOP button to stop playback.
■ Turn the shuttle ring to the left to rewind the tape when the VCR is in stop mode.
■ Turn the shuttle ring to the right to fast forward the tape when the VCR is in stop mode.

NOTE:
- If there is a power failure during playback, the VCR is in stop mode when the power comes back on.

■ PLAYBACK MODE
- When the REC/PLAY MODE button is pressed, the playback mode is switched in the order of 3H → L12H →12H →L24H→24H→3H

■ AUDIO PLAYBACK
- The modes with the letter "L"(L12H and L24H) are for audio recording and playback on the linear track.

Playback mode	3H	L12H	12H	L24H	24H
Audio playback	Available	Available	Not Available	Available	Not Available
Picture quality	Good	Vibrating	Less Vibrating	Vibrating	Less Vibrating

NOTE:
- There is normal sound playback only when a tape recorded in the 3H-L24H modes is played back in its respective mode.
- If in a higher PLAYBACK mode than the one in which it was recorded, the playback will be in slow motion; and if in a lower PLAYBACK mode, the playback will be fast.
- The picture may move up/down or noise may occur when the tape is played back in the L12H or L24H mode (even if the tape was recorded in the L12H or L24H mode).

■ When tape end is reached.
The following functions are automatically engaged when tape end is reached during playback or fast forwarding.

Tape End Selected	"REPEAT" or "ALARM • PROT"	"STOP" or "REWIND"
Playback	The tape automatically rewinds to the beginnning and stops.	Stop
Fast forward	Stop	Stop

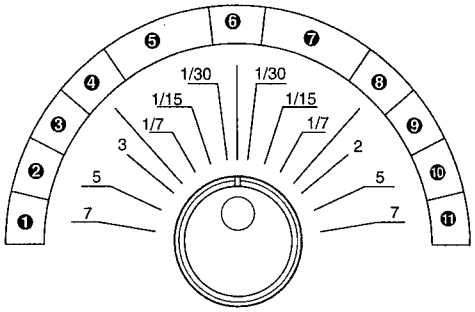
SPECIAL EFFECTS PLAYBACK

The following convenient function is available. Audio output is muted during special effects playback.

SHUTTLE RING

You can adjust the speed by using the shuttle ring.

1. Press the PLAY button to begin playback.
2. Press the PAUSE/SHUTTLE HOLD button to obtain a still picture.
3. Turn the shuttle ring to the angle for the desired playback speed.



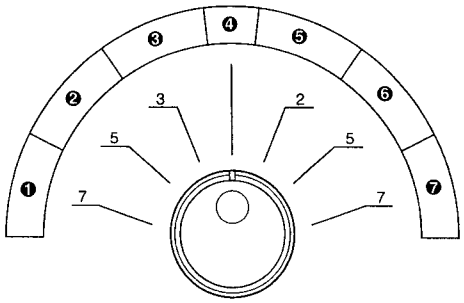
❶ Reverse high speed search
❷ Reverse speed search
❸ Reverse fast playback (x3)
❹ Reverse playback
❺ Reverse slow
❻ Still
❼ Slow playback
❽ Normal playback
❾ Fast playback (x2)
❿ Forward speed search
⓫ Forward high speed search

NOTE:

- If the shuttle ring is released, it will come back to the center position, and still mode will resume.
- Pressing the PAUSE/SHUTTLE HOLD button while turning and holding the shuttle ring, continues the play back speed you selected even though the shuttle ring is released.

DIRECT SHUTTLE RING

You can also change the playback speed without entering the PAUSE mode by turning the shuttle ring during playback.
If you release the ring, it will come back to the center position, and normal playback will resume.



❶ Reverse high speed search
❷ Reverse speed search
❸ Reverse fast playback (x3)
❹ Normal playback
❺ Fast playback (x2)
❻ Forward speed search
❼ Forward high speed search

STILL PICTURE

If you press the PAUSE/SHUTTLE HOLD button during playback, you will obtain a still picture.
Press the PAUSE/SHUTTLE HOLD button again to resume the normal playback mode.

FRAME BY FRAME PLAYBACK

You can use the jog dial to advance the tape frame by frame.

1. While the VCR is playing a tape, press the PAUSE/SHUTTLE HOLD button to freeze the picture on screen.
2. Turn the jog dial clockwise to advance the tape forward. Turn it counterclockwise to reverse the tape. When turning and holding the jog dial, a frame by frame playback continues.
3. To resume normal playback, press the PLAY button.

NOTE:

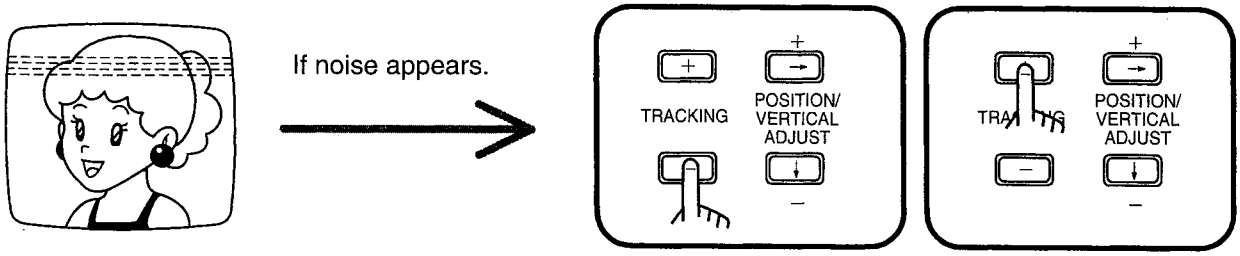
- When switching the direction, noise bars may appear on the picture.
- A few noise bars or vertical movement may appear during frame by frame playback.

ENGLISH

ADJUSTMENT DURING PLAYBACK

TRACKING ADJUSTMENT

If noise appears in the picture during playback, reverse playback or forward/reverse slow playback, adjust the picture with TRACKING buttons to achieve the best picture.



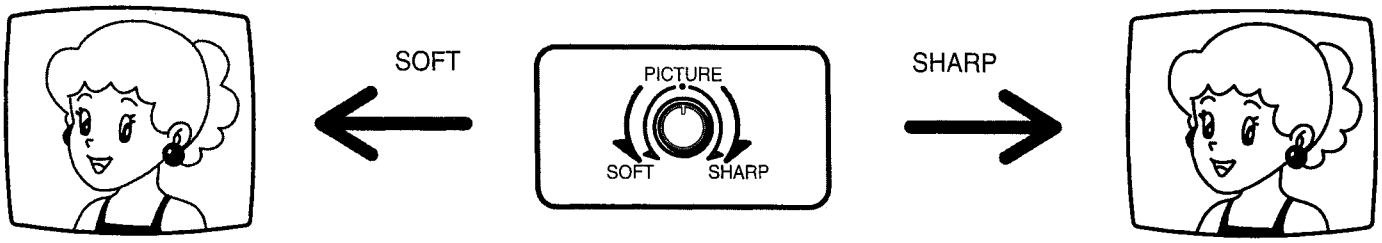
When pressing the TRACKING(+) and (-) buttons at the same time during playback, reverse playback or forward/reverse slow playback, the tracking is set to the initial setting.

NOTE:

- When in reverse playback or reverse slow mode, noise bars may appear on the screen.
- When a picture recorded in 3H mode is played back in L12H or L24H mode, noise may appear on the screen even though adjusted with tracking button.
- The noise bars will move continuously when a TRACKING button is depressed except in L12H or L24H playback mode.
- The noise bars will move every time when a TRACKING button is pressed every time in L12H or L24H playback mode.

PICTURE QUALITY ADJUSTMENT

This control allows you to adjust the playback picture so that the outline is sharper or softer.

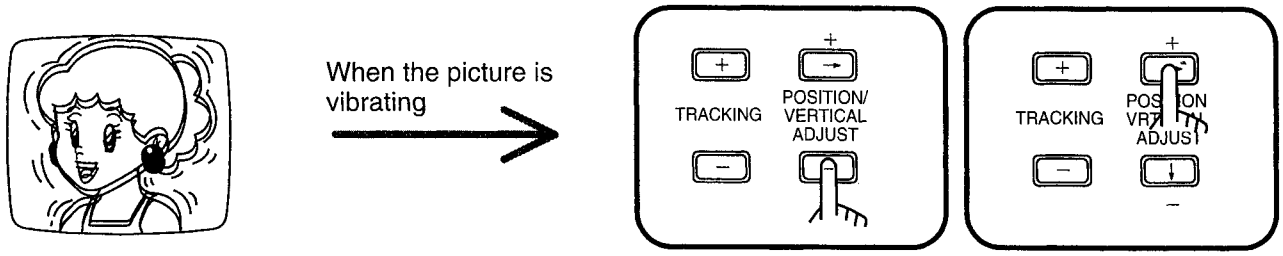


NOTE:

- This control is only effective during playback.

VERTICAL ADJUSTMENT(correcting picture vibration at the top and bottom)

When watching still, slow motion, fast playback or normal playback in L12H or L24H mode, the picture may vibrate. In this case, press the VERTICAL ADJUST(+) or (-) button to reduce or eliminate the picture vibration.



ADJUST" for 3H respectively by the following procedures.

1. Record image and still-playback the tape.
2. Press the VERTICAL ADJUST (+) or (-) button to reduce or eliminate the picture vibration.

NOTE:

- Horizontal vibration cannot be corrected with the VERTICAL ADJUST buttons.
- When the VERTICAL ADJUST (+) and (-) buttons are pressed at the same time during still playback, the VERTICAL ADJUST is set to initial setting.

WARNING DISPLAY

SELF DIAGNOSTIC FUNCTION

This unit uses a self diagnostic function to detect an internal malfunction during recording. When a malfunciton occurs in the unit during recording, the indication corresponding to each malfunction illuminates on the fluorescent display and/or on the screen. The type of malfunction corresponding to the indication, and countermeasures, are given below.

Fluorescent display	Monitor	CAUSE	REMEDY	TO TURN OFF THE INDICATION
End	TAPE END	THE TAPE ENDS DURING RECORDING	Rewind the tape or press the EJECT button.	Turn off the indication on the fluorescent display and on the screen by pressing the EJECT button or rewinding the tape.
—	NO SIGNAL	LACK OF VIDEO SIGNAL INPUT (NOTE 1)	Check for loose connections.	When a video signal is restored or the record mode is cleared, the indication on the screen turns off.
—	CHECK	TAPE/ DECK TROUBLE	First, check the cassette. If there seems to be nothing wrong with the cassette, try the recording operation again. If the indication "CHECK" is still displayed, change the cassette with a new one and try the operation again. Otherwise, unplug the power cord and contact your dealer.	

NOTE:

1. Lack of video input signal
   The indication "NO SIGNAL" appears when the VCR cannot get any video input signal during recording. The video input signal will not be obtained in case of any malfunction such as a broken video cable or POWER to the camera is turned off.

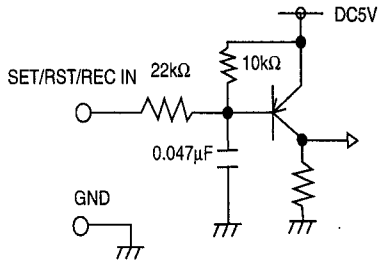
BEFORE CALLING FOR SERVICE

Symptom	Remedy
No power supplied to VCR.	• Is the LOCK indicator illuminated? • Has the Power Cord been disconnected from the AC outlet? • Is the TIMER REC indicator illuminated?
The VCR POWER is ON but unit does not operate.	• Is the LOCK indicator illuminated? • Safety devices are operating. Press the RESET button on the rear panel using a suitable implement.
No picture is obtained on the MONITOR screen.	• Is the connecting cable properly connected, or is the cable defective?
No operation when any tape operation button is pressed.	• Is the LOCK indicator illuminated? • Is a cassette inserted?
Recording does not work.	• Is the LOCK indicator illuminated? • Has the cassette's erasure prevention tab been broken off? • Has the tape run out?
Recording cannot be stopped by pressing the STOP button.	• Is the LOCK indicator illuminated? • Is the TIMER REC indicator illuminated?
Timer recording does not operate.	• Have the present time and recording time been set accurately?
No operation when the PLAY button is pressed.	• Is the LOCK indicator illuminated? • Has the tape run out? • Is a cassette inserted?
Noise bars in the picture during playback.	• Has the TRACKING control been adjusted?
The picture vibrates at the top and bottom when in still picture mode.	• Has the VERTICAL ADJUST control been adjusted?
Clear camera pictures during recording but during playback the picture is not clear.	• This symptom may occur when the recorder has been used for a long period of time. During this time, a deposit of oxide has built up on the video heads which must now be cleaned. Cleaning of the heads re quires expertise. Please contact your dealer.
The picture is not clear on the monitor.	• Is the camera focused?
The present time is not correct even if using this unit everyday.	• Make sure of the power cord is connected to the AC outlet for approximately 40 or more hours per week when using it everyday.
The power cord has been disconnected for less than 31days but the present time has been reset.	• Make sure of the power cord is connected to the AC outlet for approximately 40 or more hours per week when using it everyday. • The reserved contents may be erased even within 31 days depending on the charging time of the power failure compensation circuit. Set the present time setting again.
Repeat recording does not work.	• Is the repeat recording indicator illuminated? • Is the alarm recording started?
Alarm recording does not work.	• Is the external switch connected correctly?
Playback speed is fast or slow.	• Is the playback mode set to the desired mode with REC/PLAY MODE button.

CONTROL INPUT/OUTPUT SIGNALS AND CIRCUIT

■ SET/ RST/ REC IN terminals (screw)

Active: When input terminals are short-circuited to GND or "L" level voltage (0 - +1.6V) applied.
Time for active: 0.1 sec or over.
Non active: Open the input.

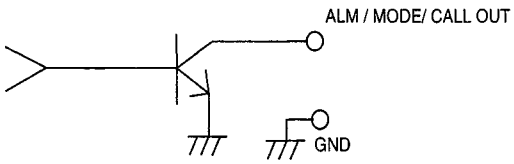


<Interface circuit inside the VCR>

■ ALM/ CALL OUT terminals (screw)

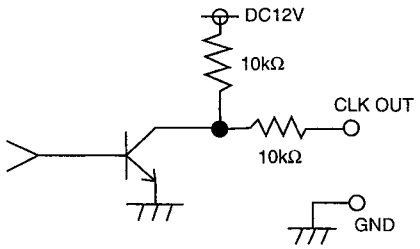
Active: "L" Level voltage (0 - +0.4V) outputted; max. drive current 50mA(+5V DC)/ 10mA(+24V DC)

Non active: Open; max. Voltage +24V DC



<Interface circuit inside the VCR>

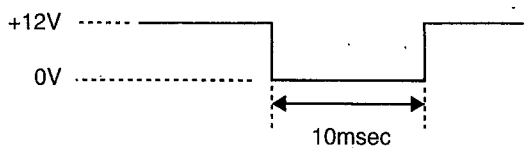
■ CLK OUT terminals (screw)



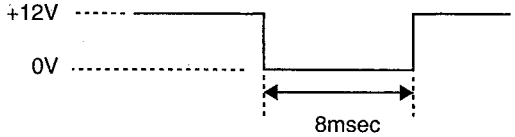
<Interface circuit inside the VCR>

CLK OUT signal

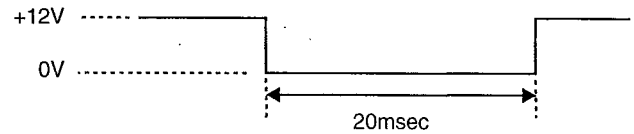
• When "F" is selected in REC of CLOCK OUT mode in 3H recording



• During recording in L12H or L24H recording mode.



• When except "F" is selected in REC of CLOCK OUT mode in 3H recording.



ENGLISH

SPECIFICATIONS

Tape format:	VHS 1/2" width high-density video cassette tape.
Power source:	AC100-230V±10%, 50/60Hz.
Power consumption:	Approx.20watts.
Television System:	CCIR standard 625 lines, 50 field PAL-type color system.
Video Recording System:	4 rotary heads, azimuth helical scanning system.
Luminance Signal:	Frequency modulation recording.
Color Signal:	Low frequency conversion, sub-carrier phase shift recording.
Audio Track:	1 track.

Tape Speed and Recording Time (with E-180 cassette):

Mode	Time	Speed	Recording interval	Video signal	Audio signal	Tape drive
3H	3hrs	23.39mm/sec	20.0msec./Field	Continuous	Recordable	Continuous
L12H	15hrs	4.68mm/sec	100.0msec./Field	Time lapse	Recordable	Continuous (Slow)
L24H	27hrs	2.60mm/sec	180.0msec./Field	Time lapse	Recordable	Continuous (Slow)

Fast Forward/Rewind Time:	Approx. 140sec. with E-180 cassette.
Heads-video:	4 rotary single crystal heads.
Audio/Control:	1 stationary head.
Erase:	1 full-track head.
Motors:	3 motors-drum/capstain direct drive system.
Video Input:	1.0Vp-p, 75ohms BNC plug.
Audio Input:	-8dBs, 50kohms, RCA plug.
Video Output:	1.0Vp-p, 75ohms, BNC plug.
Audio Output:	-6dBs, 1kohms, RCA plug.
Horizontal Resolution:	More than 330 lines (Black & White) More than 240 lines (Color)
Audio frequency response:	70 Hz- 7kHz (3H mode).
Signal-to-Noise Ratio:	Video: better than 42dB. Audio: better than 43dB.
Operating Temperature:	5°C to 40°C
Relative Humidity:	Max.80(%)
Dimensions: (JOG dial included)	425(W)x315(D)x93(H)(mm).
Weight:	4.5 kg.
Alarm Recording Time:	Timed: 15 sec/30 sec/45 sec/1 min./2 min./5 min./10 min. Manual 1: Until the alarm reset switch is switched on./ Manual 2: Until the alarm set switch is switched off.
Display format:	DISPLAY MODE 1: (Day)-(Month)-(Year) (Hour) : (Minute) : (Second) (Alarm recording no.) DISPLAY MODE 2: (Day)-(Month)-(Year) (Day of week) (Alarm recording no.), (Hour) : (Minute) : (Second) (Recording mode)
Display position:	In any position
Timer Program:	8 programs- Daily start and stop time for one week.
Battery Backup:	Lasts 31days.
Elapsed Time Indicator	The maximum of 89,999 hours.
CONNECTORS	
SET Input:	Screw terminal for starting alarm recording.
RST Input:	Screw terminal for finishing alarm recording or for adjusting on-screen clock.
REC Input:	Screw terminal for starting/finishing recording or for series recording.
GND:	Screw terminal for ground.
ALM Output:	Screw terminal for output while alarm recording is under way.
CLK Output:	Screw terminal to command camera switching.
MODE Output:	Screw terminal for indication of VCR selected mode.
CALL Output:	Screw terminal for external warning device or for series recording.
Rating:	
ALM/CALL/MODE	Active: "Low" Level, max. Current 50mA (+5VDC)/10mA (+24VDC) Non active: Open, max. Voltage +24V DC.
SET/RST/REC	Active: When terminals are short-circuited or "Low" level voltage applied. Non active: Open.
CLK	Recording: A pulse of the frequency division ratio selected by REAR TERMINAL menu.

Weight and dimensions shown are approximate.
Design and specifications are subject to change without notice.

CASTELLANO

NO COLOQUE NUNCA OBJETOS PESADOS SOBRE LA VIDEOGRABADORA.

NO TOCAR NUNCA O INSERTAR OBJETO ALGUNO EN EL INTERIOR DEL VIDEOMAGNETÓFONO
El tocar el interior de la caja o el insertar objetos extraños de cualquier clase no solo crea peligros a la seguridad del usuario sino que también será causa de graves daños.

DESCONECTE EL CABLE DE ALIMENTACION AL AUSENTARSE POR PERIODOS PROLONGADOS DE TIEMPO
Al ausentarse de casa por períodos prolongados de tiempo, apague siempre el grabador de videocassettes y desconecte el cable de alimentación.

DESENCHUFAR EL CABLE DE LA TOMA DE LA RED Y DESCONECTAR LA ANTENA EN CASOS DE AUSENCIAS PROLONGADAS
La videograbadora queda conectada a un cuando se pone el conmutador de encendido (POWER) en OFF.
Cuando se vaya de casa para estar fuera un período prolongado de tiempo, desconecte siempre el interruptor de alimentación, desenchufe el cable de la alimentación y desconecte la antena.

MANTENERLO BIEN VENTILADO
No tapar los agujeros de ventilación situados en el videomagnetófono. Para obtener una ventilación máxima, colocar la unidad solamente sobre una superficie plana y dura y asegúrese de no cubrirlo durante su utilización. No colocar nunca objetos pesados sobre el videomagnetófono.

CUANDO NO SE UTILICE
Cuando termine de hacer funcionar el videomagnetófono, extraiga siempre el casete, desconecte la alimentación.

CUIDADOS CON LA CAJA
No utilizar nunca productos de limpieza que contengan petróleo. Limpiar la caja con un paño suave humedecido en agua y jabón. Los cables del videomagnetófono no deberán estar en contacto con las superficies de la caja por un período de tiempo muy largo.

INSTALACIÓN
Para lograr un óptimo y duradero funcionamiento, instalar el videomagnetófono en un lugar que esté:
1. Bien ventilado y alejado de la luz directa del sol y de otras fuentes de calor.
2. Una superficie exenta de vibraciones.
3. Libre de excesiva humedad, polvo y alejado de campos magnéticos.

ADVERTENCIA: PARA EVITAR INCENDIOS O DESCARGAS ELÉCTRICAS, NO EXPONER EL APARATO A LA LLUVIA O LA HUMEDAD.

Este videoregistrator por intervalos está fabricado de acuerdo con las Directivas del Consejo de la Unión Europea 89/336/CEE, "EMC Directive" y la Directiva del Consejo 73/23/CEE relativa a "Directiva de Baja Tensión", de acuerdo con las modificaciones establecidas por la Directiva 93/68/CEE. Así mismo, también se observan las normativas EN 50082-1 para la inmunidad y las EN 55022 para las interferencias en lo que respecta al funcionamiento del aparato en zonas residenciales, en las empresas comerciales y de industria ligera, en las pequeñas empresas, tanto en el interior como en el exterior del edificio. Todos los lugares de funcionamiento están caracterizados por estar conectados al sistema público de alimentación de baja tensión.
Esta unidad está fabricada de acuerdo con EN 60065.

SVENSKA

PLACERA ALDRIG TUNGA FÖREMÅL T.EX. TV-MOTTAGAREN OVANPÅ VIDEOBANDSPELAREN

VARNING
Försök aldrig bryta upp kassettluckan och försök inte att peta i videons mekanism med stålverktyg.

DRA UT NÄTLEDNINGEN UR NÄTUTTAGET NÄR DU ÅKER BORT PÅ SEMESTER OCH/ELLER LIKNANDE LÄNGRE RESOR.
Strömförsörjningen till videobandspelaren forsätter även när nätströmbrytaren (POWER) ställs i läget OFF (frånslaget läge).

NÄR VIDEON INTE ANVÄNDS
Efter användning skall alltid bandet återspolas och tas ur videon. Slå av strömmen.

PLACERING
För högsta prestanda och livslängd skall videon placeras på;
1. Väl ventilerad plats utan direkt solljus.
2. Stabilt vibrationsfritt underlag.
3. Ett ställe med normal luftfuktighet, lite damm och utan störande starka magnetfält.

NÄTLEDNING
Se till att nätledning inte utsätts för mekanisk åverkan, dvs skarpa böjar, knutar etc.
Vid skada skall original sladd användas vid utbytte.

VENTILATION
Blockera inte ventilationshålen på videobandspelaren. Placera videobandspelaren endast på ett hårt, jämnt underlag och se till att ventilationshålen inte blockeras under videobandspelarens användning för att tillförsäkra bästa, möjliga ventilation.

HÖLJE
Rengör videon med lätt fuktad duk. Använd aldrig lösningsmedel. Låt inte PVC-klädda ledningar ligga under lång tid i direktkontakt med höljet.

VARNING: UTSÄTT INTE DENNA APPARAT FÖR REGN OCH FUKT FÖR ATT UNDVIKA RISKERNA FÖR BRAND OCH ELEKTRISKA STÖTAR.

Denna videobandspelare med expanderad inspelningstid uppfyller kraven i EG direktiv 89/336/EEC, "EMC Directive" och 73/23/EEC, "Low Voltage Directive", samt ändringsdirektiv 93/68/EEC. Kraven angående känslighet enligt EN 50082-1 och de angående sörningar enligt EN 55022 möts för heminstallationer, affärsinstallation samt installationer i små industrier och småföretag. Alla installationer kännetecknas av anslutning till det publika lågspänningsnätet.
Denna apparat är tillverkad enligt bestämmelsen EN 60065.

NEDERLANDS

ZWARE VOORWERPEN DIENEN NOOIT OP DE VIDEO CASSETTERECORDER GEPLAATST TE WORDEN (BIJV. TELEVISIE)

RAAK DE BINNENKANT VAN DE VCR NOOIT AAN EN STEEK ER GEEN VOORWERPEN IN
Het aanraken van de binnenkant van het toestel of het er insteken van vreemde voorwerpen is niet alleen gevaarlijk maar kan ook ernstige beschadigingen veroorzaken.

BEHANDELING VAN HET NETSNOER
Een beschadigd netsnoer is een potentieel brand- en schokgevaar.
Wanneer u het netsnoer uit het stopkontakt trekt moet u het bij de stekker vasthouden (niet bij het snoer) en voorzichtig trekken.

TREK DE STEKKER UIT HET STOPKONTAKT WANNEER U EEN LANGERE TIJD AFWEZIG BENT
Wanneer de netschakelaar afstaat is de VCR toch nog altijd via het netsnoer verbonden met een stopkontakt.

ZORG VOOR EEN GOEDE VENTILATIE
Bedek nooit de ventilatiegaten van de VCR. Voor een goede ventilatie moet u ervoor zorgen dat het toestel op een harde vlakke oppervlakte staat en niet bedekt is wanneer het in gebruik is. Zware voorwerpen mogen nooit op de VCR geplaatst worden.

WANNEER HET TOESTEL BUITEN GEBRUIK IS
Wanneer u de VCR niet gebruikt moet u de kassette eruit halen en de stroom uitschakelen.

ONDERHOUD VAN DE BEHUIZING
Gebruik nooit schoonmaakprodukten op basis van petroleum. Gebruik een zachte doek die bevochtigd is met water en zeep en droog het toestel daarna goed af.
PVC kabels of snoeren mogen niet voor een langere tijd in kontakt zijn met de behuizing.

PLAATS VAN OPSTELLING
Om een zo goed mogelijke werking en een lange levensduur te verzekeren moet u het toestel op een plaats opstellen die:
1. Goed geventileerd, uit het zonlicht en niet nabij hittebronnen gelegen is.
2. Op een vast trillingvrij oppervlak.
3. Vrij van een hoge vochtigheidsgraad, stof en verwijderd van magnetische velden.

WAARSCHUWING: TER VOORKOMING VAN BRAND OF ELEKTRISCHE SCHOKKEN, DIT TOESTEL NIET AAN REGEN OF VOCHT BLOOTSTELLEN.

Deze timer-gestuurde video cassettespeler voldoet aan de eisen van EG richtlijn 89/336/EEC, "EMC Directive" en 73/23/EEC, "Low Voltage Directive", gewijzigd met richtlijn 93/68/EEC. Aan de vereisten i.v.m. gevoeligheid volgens EN 50082-1 en de vereisten i.v.m. interferentie volgens EN 55022 wordt tegemoet gekomen voor zover de bediening gebeurt in woongebieden, handelspanden en licht industriële gebouwen en in kleinschalige ondernemingen, zowel binnen als buiten de gebouwen. Alle bedrijfsplaatsen hebben als gemeenschappelijk kenmerk dat ze zijn aangesloten op het openbare laagspnningsnet.
Dit toestel is vervaardigd in overeenstemming met EN 60065.

PORTUGES

NUNCA COLOCAR OBJECTOS PESADOS SOBRE O VIDEOGRAVADOR (E.G., TV)

NUNCA INTRODUZA NENHUM OBJECTO NEM TOQUE NO INTERIOR DO VIDEOGRAVADOR
Tocar o interior da caixa ou introduzir objectos estranhos de qualquer tipo, não só atenta contra a segurança como pode provocar graves avarias.

PROTEJA O FIO DE CORRENTE
Estragos no fio de corrente poderão dar origem a incêndio ou perigo de choque. Para desligar, segure apenas pela ficha e puxe cuidadosamente.

DESLIGUE O FIO DE CORRENTE DURANTE UMA LONGA AUSÊNCIA
Desligue a corrente e retire a ficha do tomada durante uma ausência prolongada.

MANTENHA BOA VENTILAÇÃO
Não obstrua os orifícios principais de ventilação do videogravador. Para máxima ventilação, coloque o aparelho apenas numa superfície rígida e plana e certifique se que o mesmo não fica coberto durante o uso. Nunca coloque objectos pesados sobre o videogravador.

QUANDO NÃO ESTIVER EM USO
Quando acabar de operar o videogravador retire sempre a cassete e desligue (OFF) a corrente (POWER) do videogravador.

CUIDADOS COM A CAIXA
Nunca use produtos de limpeza à base de petróleo. Limpe com um pano macio humedecido com água e sabão e a seguir seque. Os cabos e fios de PVC não devem ser deixados em contacto com a superfície da caixa por períodos longos.

LOCALIZAÇÃO DA INSTALAÇÃO
Para um comportamento excelente e fiabilidade durável instale num local que seja:
1. Bem ventilado, longe da luz directa do sol e longe de calor directo.
2. Uma superfície sólida isenta de vibrações.
3. Livre de humidade ou poeira excessivas e longe de qualquer campo magnético.

ATENÇÃO: PARA EVITAR PERIGO DE FOGO OU DE CHOQUE, NÃO EXPONHA ESTE APARELHO À CHUVA OU À HUMIDADE.

Este Videogravador cumpre os requisitos da Directiva da CE 89/336/CEE, "Directiva EMC" e 73/23/CEE, "Directiva Baixa Voltagem", emendada pela Directiva 93/68/CEE. Os requisitos para a susceptibilidade de acordo com a NE 50082-1 e os requisitos para a interferência de acordo com a NE 55022, são observados para a operação em áreas residenciais, escritórios, instalações de indústria ligeira e em empresas de pequena dimensão, dentro e fora do edifício. Todos os locais de operação são caracterizados pela sua ligação ao sistema de abastecimento público de energia de baixa voltagem.
Esta unidade foi fabricada de acordo com a NE 60065.